Name: Date:

Polynomial Factoring solution (version 693)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 31 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(31)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 124}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-108}}{2}$$

$$x = \frac{-4 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-4 \pm 6\sqrt{3}\, i}{2}$$

$$x = -2 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 - 9i$ and $-6 + 4i$ in standard form $(a + bi)$.**

Solution

$$(3 - 9i) \cdot (-6 + 4i)$$

$$-18 + 12i + 54i - 36i^2$$

$$-18 + 12i + 54i + 36$$

$$-18 + 36 + 12i + 54i$$

$$18 + 66i$$

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3. **Write function $f(x) = x^3 - 2x^2 - x + 2$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-2	-1	2
1		1	-1	-2
	1	-1	-2	0

$$f(x) = (x-1)(x^2 - x - 2)$$

$$f(x) = (x-1)(x-2)(x+1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4) \cdot (x+1)^2 \cdot (x-2)^2 \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.